in the middle of the plurality of side images of the object with respect to the ROI image, and by rotating the image of the scanned object by a difference between the mean of the gradients and the horizontal direction, that is, zero degrees.

As another example, in a case where the object is a fetus, the 3D ultrasound system may detect a region of which brightness intensity has a small value based on a selected brightness intensity, that is, a region of which bright intensity is darker than the selected brightness intensity, from the plurality of side images with respect to the ROI image, and determine a region of the fetus' NT from the detected region. Then, the 3D ultrasound system may detect a first edge corresponding to an upper boundary in the region of the fetus' NT, and a second edge corresponding to a lower boundary in the region of the fetus' NT. In this instance, the 3D ultrasound system may detect the first and second edges in the region of the fetus' NT, detected from the side image corresponding to a sagittal view.

In operation **305**, the 3D ultrasound system measures the thickness of the selected image by using the detected edges. That is, the 3D ultrasound system may detect the thickness of the image by measuring distances between first and second edges with respect to the plurality of side images.

The 3D ultrasound system may calculate at least one of the mean, standard deviation, minimum distance, and maximum distance of the distances between a plurality of first edges and a plurality of second edges and then display at least one of the mean, the standard deviation, the minimum distance, and the maximum distance on a screen. In a case where the maximum distance is calculated among the distances between the plurality of first edges and the plurality of second edges, the 3D ultrasound system may distinctly display a boundary between the first edge and the second edge of the side image corresponding to the maximum distance.

As described above, according to embodiments, edges are detected from a plurality of side images of an object in a human body with respect to a region of interest (ROI) image in an image of the object, and the thickness of the image is automatically measured using the detected edges, to enable a precise measurement result of the thickness of the image to be provided.

The above-described exemplary embodiments of the present invention may be recorded in non-transitory computer-readable media including program instructions to implement various operations embodied by a computer. The media may also include, alone or in combination with the program instructions, data files, data structures, and the like. Examples of non-transitory computer-readable media include magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD ROM disks and DVDs; magneto-optical media such as optical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory (ROM), random access memory (RAM), flash memory, and the like. Examples of program instructions include both machine code, such as produced by a compiler, and files containing higher level code that may be executed by the computer using an interpreter.

Although a few exemplary embodiments of the present invention have been shown and described, the present invention is not limited to the described exemplary embodiments. Instead, it would be appreciated by those skilled in the art that changes may be made to these exemplary embodiments without departing from the principles and spirit of the invention, the scope of which is defined by the claims and their equivalents.

What is claimed is:

1. 3-dimensional (3D) ultrasound system comprising:

an extractor configured to scan a 3D ultrasound data of a fetus and to extract a side image of the fetus from the 3D ultrasound data, the side image including an NT (nuchal translucency) region of the fetus;

a processor configured to detect a first edge and a second edge of the NT region included in the side image; and

a controller configured to measure the thickness of the NT region based on a distance between the first edge and the second edge,

wherein the processor detects the first edge of which brightness intensity is changed from a large value to a small value in the side image, and detects the second edge of which brightness intensity is changed from a small value to a large value in the side image.

2. The 3D ultrasound system of claim **1**,

wherein the extractor is further configured to extract an ROI image including the NT region from the side image, and

wherein the processor detects the first edge and the second edge of the NT region included in the ROI image.

3. The 3D ultrasound system of claim **1**, wherein the side image corresponds to a sagittal view of the fetus.

4. The 3D ultrasound system of claim **2**, wherein the processor detects the NT region from a region of which brightness intensity is smaller than on a reference brightness intensity in the ROI image, and detects the first edge corresponding to an upper boundary of the NT region and the second edge corresponding to a lower boundary of the NT region.

5. The 3D ultrasound system of claim **1**, wherein the controller obtains the maximum distance between the first edge and the second edge, and measures the thickness of the measurement region based on the maximum distance.

6. The 3D ultrasound system of claim **1**, wherein the controller controls to distinctly display the first edge and the second edge.

7. A method for operating a 3D ultrasound system, the method comprising:

scanning a 3D ultrasound data of a fetus and extracting a side image of the fetus from the 3D ultrasound data, the side image including an NT (nuchal translucency) region of the fetus;

detecting a first edge and a second edge of the NT region included in the side image; and

measuring the thickness of the NT region based on a distance between the first edge and the second edge,

wherein the detecting comprises detecting the first edge of which brightness intensity is changed from a large value to a small value in the side image and detecting the second edge of which brightness intensity is changed from a small value to a large value in the side image.

8. The method of claim **7**,

wherein the extracting the side image comprises extracting an ROI image including the NT region from the side image according to a user input,

wherein the detecting comprises detecting the first edge and the second edge of the NT region included in the ROI image.

9. The method of claim **7**, wherein the side image corresponds to a sagittal view of the fetus.

10. The method of claim **8**, wherein the detecting further comprises:

detecting the NT region from a region of which brightness intensity is smaller than on a reference brightness intensity in the ROI image; and